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A NEW VARIETY OF *EUTROCHIUM PURPUREUM* (EUPATORIEAE: ASTERACEAE)

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ABSTRACT

Eutrochium purpureum var. **carolinianum** Sorrie var. nov. is described from the lower piedmont of North Carolina and South Carolina, USA. Its morphological features are compared with the two currently recognized varieties of *E. purpureum*.

KEY WORDS: *Eutrochium purpureum* var. *carolinianum* Sorrie var. nov., Asteraceae, Eupatorieae

Atypical specimens of *Eutrochium purpureum* (L.) E. Lamont (= *Eupatorium purpureum* L.) found in the lower piedmont of North Carolina and South Carolina, represent a distinct and previously unrecognized variety.

Eutrochium purpureum (L.) E. Lamont var. **carolinianum** Sorrie, var. nov. Figs. 1, 2, 3. **TYPE**: **USA**. **North Carolina**. Stanly Co.: open powerline southeast of Stony Hill Church, dominated by grasses and herbs, dry soil derived from mafic rock, common, 14 July 2009, *B.A. Sorrie 12380* (holotype: NCU).

Eutrochio purpureo var. *purpureo* similis sed differt foliis late ovatis ad apices obtusis vel acutis, omnino dense lanulosis abaxaliter, marginibus obtuse serratis, et glandibus acheniorum numerosioribus elongatioribus.

Etymology. The varietal name is derived from the two-state region in which the plants grow. Species formerly treated within *Eupatorium* sect. *Verticillatum* DC. have recently been segregated as the genus *Eutrochium* Raf. (Lamont 2006).

Additonal collections examined. **North Carolina**. Anson Co: upland woods, Pee Dee River, 2.5 mi northeast of Old Sneedsboro, 21 Sep 1956, *Ahles 19432 with Leisner* (NCU). Cabarrus Co.: low woodland border, 1.2 mi west of jct. of NC 27 and US 601 on NC 27, 23 Sep 1956, *Ahles 19754 with Leisner* (NCU). Gaston Co.: wooded stream, 4.1 mi east of Gastonia just north of US 29-74 on Ranlo Road, 17 Sep 1956, *Ahles 18857 with Leisner* (NCU). Montgomery Co.: woodland border, 1.8 mi southeast of Montgomery-Stanly county line (Pee Dee River) on NC 27-73, 6 Jul 1956, *Ahles 16290 with Leisner* (NCU). Moore Co.: narrow powerline on steep slope, George P Road north of Deep River, 24 Jul 2005, *Sorrie 11664* (NCU). Richmond Co.: west of US 1 and east of Pee Dee River, along dirt logging road, disturbed loblolly pine plantation with regenerating hardwoods, 22 Jun 1999, *Sorrie 10175* (NCU). Stanly Co.: upland oak woods, 1.7 mi south of Millingport on Millingport-Lambert Road, 6 Jul 1956, *Ahles 16213 with Leisner* (NCU); north side Jacobs Creek, southwest of SR 1739, frequent in ravine on side of high hill, 17 Oct 2007, *Sorrie 12054* (NCU). Union Co.: roadside, 0.8 mi north-northwest of Waxhaw on NC 16, 14 Jul 1957, *Ahles, 31387 with Haesloop* (NCU); roadside bank on Austin Road (SR 1256), 0.4 mi north of South Carolina line, 12 Jul 2010, *Sorrie 12624* (NCSC). **South Carolina.** Abbeville Co.: roadside, Parsons Mountain, 6 mi south of Abbeville, 29 Jun 1957, *Radford 25939* (NCU). Fairfield Co.: roadside at jct. county routes 22 and 28 west of Woodward, 26 Jun 1957, *Bell 9354* (NCU). Lancaster Co.: rich mesic woods, 40 Acre Rock, NNE of Kershaw, 6 Jun 1957, *Ahles 27456 with Haesloop* (NCU). York Co.: wooded

slope along Sugar Creek on SC 160, east of Fort Mill, 12 Jul 1957, *Ahles 31168 with Haesloop* (NCU).

While synonymizing a number of previously named taxa within *Eupatorium purpureum* L., Lamont (1995, 2006) recognized a widespread variety *E. purpureum* var. *purpureum* in eastern North America plus a midwestern variety *E. purpureum* var. *holzingeri* (Rydberg) E. Lamont. The latter differs from the typical variety in its "densely puberulent to villous" abaxial sides of leaves (Lamont 1995); it ranges from southern Wisconsin to eastern Nebraska and south to northern Arkansas. In var. *holzingeri*, pubescence occurs on the abaxial leaf blade surface as well as on leaf veins and is composed of pale translucent-white, lanulose hairs. Pubescence, if any, on abaxial sides of leaves of var. *purpureum* is restricted to major veins. Lamont (1995, 2006) stated that "West of the Mississippi River (and in the high xeric sand-hills of South Carolina), abaxial leaf faces [of var. *purpureum*] are commonly densely pubescent along the major veins."

	var. *carolinianum*	var. *holzingeri*	var. *purpureum*
Leaf shape	Broadly ovate to broadly elliptical, tip acute to blunt.	Broadly lanceolate to narrowly ovate, tip acuminate to acute.	Broadly lanceolate to narrowly ovate, tip acuminate to acute.
Leaf margin teeth	Short, acute to bluntish, not doubly serrate.	Long, sharply serrate or doubly serrate.	Long, sharply serrate or doubly serrate.
Leaf abaxial surface	Densely soft lanulose on surface and veins.	Densely soft lanulose on surface and veins.	Glabrate, or sparsely lanulose on veins; densely lanulose on veins west of Mississippi River.
Leaf texture	Thickish, +/- rugose.	Thin, not rugose.	Thin, not rugose.
Achene glands at anthesis	Numerous to abundant, distinctly long-papillate.	Sparse to moderate, very short-papillate.	Sparse to moderate, very short-papillate.
Range	Lower piedmont of NC-SC	Midwestern plains	Most of eastern U.S. and s Ont.; encompasses ranges of other 2 vars.

Table 1. Comparison of *Eutrochium purpureum* var. *carolinianum*, var. *holzingeri*, and var. *purpureum*.

The new variety differs in several ways from Lamont's two varieties (Table 1). Note that var. *carolinianum* exhibits significant departures from the norm of *E. purpureum* in leaf shape, marginal teeth morphology, and distribution of vestiture on the abaxial surface. The latter condition is matched only by var. *holzingeri*, which is disjunct by more than 800 km to the west. These differences give the new variety a very different gestalt than plants of var. *purpureum*, which grows sympatrically with var. *carolinianum* but is not known to be syntopic with it. Leaf shape and the somewhat thicker leaf texture are similar to those of *E. dubium* (Willd. ex Poir.) E. Lamont, but that species' leaves are much more rugose, the leaves have three main leaf veins, and it inhabits wetlands of the coastal plain, not dry uplands of the piedmont. *Eupatorium steelei* (E. Lamont) E. Lamont has similarly shaped leaves as var. *carolinianum*, but marginal teeth are sharply serrate, stems are pubescent throughout (vs. glabrous or glabrate below the inflorescence), and it occurs in the montane region of the Southern Appalachians.

The shape and abundance of achene glands of var. *carolinianum* also exhibit significant differences from other varieties of *Eutrochium purpureum*. In the latter, glands are short-papillate or nearly sessile, and often become difficult to see as the achene matures. In the new variety, the glands appear to be more numerous, are distinctly longer, and remain easily visible throughout maturation of the achene.

A small number of specimens show intermediate character states between var. *purpureum* and var. *carolinianum*. These mostly display increased pubescence on leaf abaxial veins and surfaces as compared with var. *purpureum*, but none of them are as densely lanulose as in var. *carolinianum*, nor do they have long-papillate glands on the achenes. Leaf shape and dentition correspond with var. *purpureum* in most specimens. Specimens showing some intermediacy have been seen from Guilford, Iredell, Macon, and Transylvania counties (North Carolina), McCormick County (South Carolina), and Montgomery County (Virginia). Only the McCormick County specimen seems equivocal in identity. The others are outside of the range of var. *carolinianum*, as outlined here, and are identified here as var. *purpureum*.

Phenology. As with sympatric plants of var. *purpureum*, plants of the new variety commence blooming in late June and early July, some three weeks ahead of the two other species of *Eutrochium* in the general region (*E. dubium* and *E. fistulosum* (Barratt) E. Lamont).

Habitat. Plants of the new variety inhabit dry oak-hickory woodlands and openings in them or through them, such as roadsides and powerlines. Canopy species include *Quercus alba*, *Q. stellata*, *Carya glabra*, *C. carolinae-septentrionalis*, and *Acer rubrum*. Understory trees include *Cercis canadensis*, *Ulmus alata*, *Acer leucoderme*, *Cornus florida*, and *Juniperus virginiana*. The range of the new variety lies mostly within the Carolina Slate Belt; local soils are usually derived from mafic metamorphic rocks and are somewhat acidic to circumneutral. Most populations of *E. purpureum* var. *carolinianum* occur in forest openings or clearings, but other populations occur under a dense canopy. In the latter situation, one would expect co-occurrence with var. *purpureum*, but to date the two taxa have not been found growing together (syntopically). This may be an artifact of limited field work, for var. *purpureum* also occurs in virtually all of the counties vouchered for var. *carolinianum*, as evidenced by historical specimens. In any event, a slight shift in habitat preference may contribute to lessened genetic contact.

Phytogeography. Despite its reputation for being floristically uninteresting, the lower Piedmont of the Carolinas (and sometimes extending into adjacent states) features a substantial number of endemic and disjunct taxa adapted to sunny and open habitats, including *Acmispon helleri* (Britt.) Heller, *Helianthus laevigatus* Torr. & Gray, *Helianthus schweinitzii* Torr. & Gray, *Silphium terebinthinaceum* Jacq., *Solidago plumosa* Small, and *Solidago radula* Nutt. Other endemics and disjuncts are adapted to more shaded habitats: *Carex impressinervia* Bryson, Kral, & Manhart, *Euphorbia mercurialina* Michx., *Eurybia mirabilis* (Torr. & Gray) Nesom, and *Phacelia covillei* S. Wats. ex Gray. This suite of taxa suggests an interesting biogeographic history of habitats of the region, which has generated and maintained a distinctive flora.

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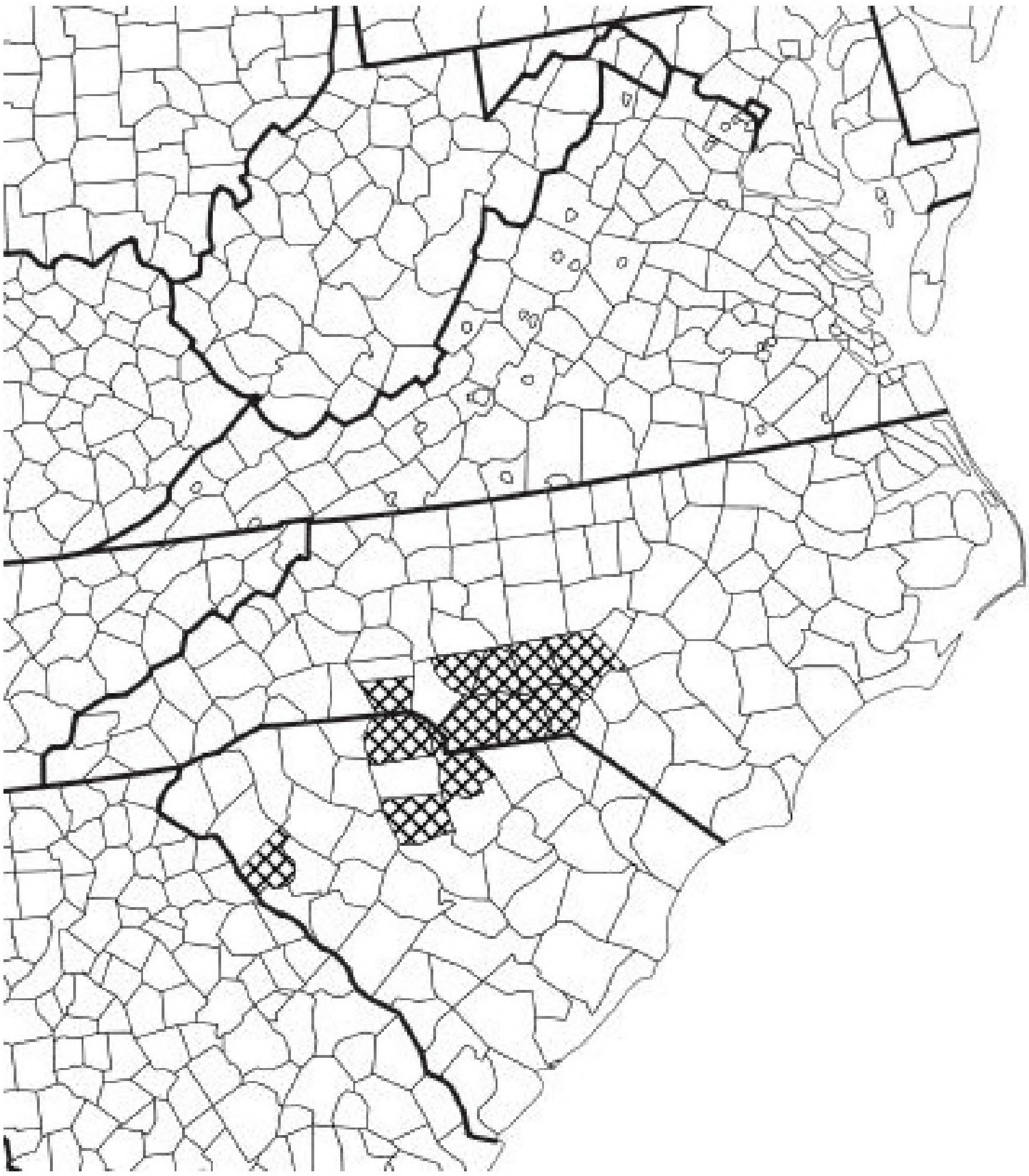

Figure 1. Distribution of *Eutrochium purpureum* var. *carolinianum*. Var. *purpureum* occurs throughout the range of var. *carolinianum* (see text).

NORTH CAROLINA FLORA
Species Eutrochium purpureum (L.) Lamont
Date 14 July 2009
County Stanly
Location Powerline southeast of Stony Hill Church.
Habitat Open powerline dominated by grasses and herbs; dry mafic soil. Common, with Monarda fistulosa, Eutrochium purpureum, Pycnanthemum incanum, Verbesina occidentalis. Leaves shorter and blunter than nominate, margins crenate, densely pubescent beneath.
B.A. Sorrie 12380

Figure 2. Holotype of *Eutrochium purpureum* var. *carolinianum*.

Figure 3. Leaves of *Eutrochium purpureum* var. *carolinianum* showing densely soft-lanulose abaxial surface and veins and thickish, rugose texture.